

# Joint Research Centre

## Certified reference materials for element content in food and feeding stuff



### Single cell protein

Element	BCR-273 (mg/g) 10 g	BCR-274 (µg/g) 10 g
As		0.132 ± 0.014
Ca	11.97 ± 0.14	
Cd		0.030 ± 0.002
Co		0.039 ± 0.003
Cu		13.1 ± 0.4
Fe	0.156 ± 0.004	
K	2.22 ± 0.05	
Mn		51.9 ± 1.2
N	121.6 ± 0.8	
P	26.8 ± 0.4	
Pb		0.044 ± 0.010
Se		1.03 ± 0.05
Zn		42.7 ± 1.0

### Various foodstuff from plant origin

Element	BCR-191 Brown bread 25 g	IRMM-804 Rice flour 15 g	BCR-679 White cabbage 15 g
As mg/kg		0.049 ± 0.004	
B mg/kg			(27.7 ± 1.9)
Ba mg/kg			(10.3 ± 0.6)
Ca mg/kg			(7768 ± 655)
Cd mg/kg	0.0284 ± 0.014	1.61 ± 0.07	1.66 ± 0.07
Cr mg/kg			(0.6 ± 0.1)
Cu mg/kg	2.63 ± 0.07	2.74 ± 0.24	2.89 ± 0.12
Fe mg/kg	40.7 ± 2.3		55.0 ± 2.5
Hg µg/kg			6.3 ± 1.4
Mg mg/kg			(1362 ± 127)
Mn mg/kg	20.3 ± 0.7	34.2 ± 2.3	13.3 ± 0.5
Mo mg/kg			14.8 ± 0.5
Ni mg/kg			27.0 ± 0.8
P mg/kg			(3307 ± 241)
Pb µg/kg	187 ± 14	420 ± 70	
Sb µg/kg			20.6 ± 2.6
Sr mg/kg			11.8 ± 0.4
Tl µg/kg			3.0 ± 0.3
Zn mg/kg	19.5 ± 0.5	23.1 ± 1.9	79.7 ± 2.7

(Values in brackets are not certified)

### Confidence in measurements

All certificates and detailed production information can be found at <https://crm.irmm.jrc.ec.europa.eu>

<https://ec.europa.eu/jrc/>

## Various food stuff from animal origin

Element (mg/kg)	BCR-185R Bovine liver 15 g	ERM-BB184 Bovine muscle 7 g	ERM-BB186 Pig kidney 10 g	ERM-BB422 Fish muscle 10 g	ERM-CE278k Mussel tissue 8 g
As	0.0330 ± 0.0029	0.0234 ± 0.0026	(0.008 ± 0.006)	12.7 ± 0.7	6.7 ± 0.4
Cd	0.544 ± 0.017	0.0022 ± 0.0004	1.09 ± 0.05	0.0075 ± 0.0018	0.336 ± 0.025
Cr					0.73 ± 0.22
Cu	277 ± 5	2.31 ± 0.09	36.5 ± 1.8	1.67 ± 0.16	5.98 ± 0.27
Fe		75 ± 4	255 ± 13	9.4 ± 1.4	161 ± 8
Hg		(0.0018 ± 0.0010)	(0.023 ± 0.011)	0.601 ± 0.030	0.071 ± 0.007
I				1.4 ± 0.4	
Mn	11.07 ± 0.29	0.276 ± 0.013	7.26 ± 0.25	0.368 ± 0.028	4.88 ± 0.24
Ni					0.69 ± 0.15
Pb	0.172 ± 0.009		0.040 ± 0.005		2.18 ± 0.18
Rb					2.46 ± 0.16
Se	1.68 ± 0.14	0.45 ± 0.04	10.3 ± 0.9	1.33 ± 0.13	1.62 ± 0.12
Sr					19.0 ± 1.2
Zn	138.6 ± 2.1	146 ± 7	134 ± 5	16.0 ± 1.1	71 ± 4

(Values in brackets are not certified.)

## Skimmed milk powder

Element	ERM-BD150 (spiked) 20 g	ERM-BD151 (spiked) 20 g
Ca g/kg	13.9 ± 0.8	13.9 ± 0.7
Cd mg/kg	0.0114 ± 0.0029	0.106 ± 0.013
Cl g/kg	9.7 ± 2.0	9.8 ± 1.2
Cu mg/kg	1.08 ± 0.06	5.00 ± 0.23
Fe mg/kg	4.6 ± 0.5	53 ± 4
Hg mg/kg	0.060 ± 0.007	0.52 ± 0.04
I mg/kg	1.73 ± 0.14	1.78 ± 0.17
K g/kg	17.0 ± 0.7	17.0 ± 0.8
Mg g/kg	1.26 ± 0.10	1.26 ± 0.07
Mn mg/kg	0.289 ± 0.018	0.29 ± 0.03
Na g/kg	4.18 ± 0.19	4.19 ± 0.23
P g/kg	11.0 ± 0.6	11.0 ± 0.6
Pb mg/kg	0.019 ± 0.004	0.207 ± 0.014
Se mg/kg	0.188 ± 0.014	0.19 ± 0.04
Zn mg/kg	44.8 ± 2.0	44.9 ± 2.3

## How to order reference materials

### From JRC in Geel

Tel.: +32 14 571 705 • Fax: +32 14 590 406  
<https://ec.europa.eu/jrc/en/reference-materials>  
 E-mail: [jrc-irmm-rm-distribution@ec.europa.eu](mailto:jrc-irmm-rm-distribution@ec.europa.eu)

### From authorised distributors

**LGC Standards GmbH (DE)**  
<http://www.lgcstandards.com/>  
 E-mail: [de@lgcstandards.com](mailto:de@lgcstandards.com)

**Sigma-Aldrich Chemie GmbH (CH)**  
<http://www.sigmaaldrich.com/irmm>  
 E-mail: [flukatec@sial.com](mailto:flukatec@sial.com)

**Sigma-Aldrich RTC Inc. (USA)**  
<http://www.RT-Corp.com>  
 E-mail: [RTCSalesgroup@sial.com](mailto:RTCSalesgroup@sial.com)

**ARMi (USA)**  
<http://www.armi.com>  
 E-mail: [Info@ARMi.com](mailto:Info@ARMi.com)

**Industrial Analytical (RSA)**  
<http://www.industrialanalytical.co.za>  
 E-mail: [info@industrialanalytical.co.za](mailto:info@industrialanalytical.co.za)



**Accredited CRM Producer:** the JRC-IRMM is accredited to ISO Guide 34:2009 for the production of reference materials under the code BELAC 268-RM